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ABSTRACT

An analysis of correlative constructions in Chinese that: (1) gives a principled account of the distribution of correlative markers; and (2) offers an explanation for some puzzling facts about distribution of anaphoric pronouns is presented. It is suggested that previous research has misidentified instances of verb phrase coordination as zero-anaphora in such constructions, which raises a more general question about zero anaphora. It is suggested that better criteria for identification of zero-anaphora are required in languages like Chinese, which lacks corroborative evidence such as agreement morphology. It is concluded, then, that for at least a subset of Chinese, a better account is available without zero-anaphors. (MSE)

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Correlative Constructions in Chinese*

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CORRELATIVE CONSTRUCTIONS IN CHINESE*

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Chinese possesses a construction-type known as 'correlative constructions'. Such constructions are characterised by the presence of a pair[1] of morphemes marking the constituent halves of the construction. Examples (taken from Liu 1981) are as follows in which the markers of the correlative construction are italicised:

(1) Zhuxi *yi* chulai, qunzhong *jiu* pai-zhang
chairman as-soon-as come-out, masses then applaud
As soon as the chairman appeared the masses applauded

(2) *Suiran* An Xian nianji xiao,
although An xian age small,
ta *que* shemme dou hui
he however anything all can
Although An Xian is young, he can do everything

(3) *Yinwei* Da Niu sheng bingle,
because big ox grow sick,
suoyi ta mei-lai shang ke
therefore he did-not-come attend class
Because Da Niu is ill he didn't come to class

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* An earlier version of this paper was read to the Autumn meeting of the Linguistics Association of Great Britain in 1986. The authors would like to thank participants at that meeting for their comments, in particular Elisabet Engdahl and Dick Hudson, neither of whom are responsible for our failure to take their advice.

1 Or in some cases an n-tuple. We restrict our attention in this paper to pairs, although the analysis that we propose should extend unproblematically to n-tuples.

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In this paper we propose that the properties of these constructions are most satisfactorily accounted for if they are treated as being multi-headed; that is, both halves of the construction are heads. The theoretical framework that we assume for concreteness is that of Generalised Phrase Structure Grammar (GPSG) as presented in Gazdar et. al. (1985), although we believe that the essentials of our analysis will transfer to any framework which exploits a feature decomposition of categories and a schema for constituent coordination. In effect, we are proposing a theoretical reconstruction and justification of Chao's (1968) contention that these are coordinate constructions.[2]

A fruitful starting point for discussion of the properties of these constructions is a paper by Liu Feng-hsi (Liu 1981). Liu presents a more extensive range of examples than those provided so far. More specifically, the examples in (1-3) only represent a subset of the possible patterns involving the correlative markers *yi...jiu* (as soon as...then), *suiran...que* (although...yet), and *yinwei...suoyi* (because...therefore). (4)-(7) show that correlative markers fall into four groups with respect to their permitted linear order relative to the subject:

(4) a. Zhuxi *yi* chulai, qunzhong *jiu* gu-zhang
chairman as-soon-as come-out, masses then applaud
As soon as the chairman appeared the masses applauded
b. **Yi* zhuxi chulai, *jiu* qunzhong gu-zhang

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2 Chao (1968:793) lists the following set of correlative markers (transcription altered from GR to Pinyin [CJC/SJH]): *yue...yue* (the more...the more), *ye...ye/you...you* (both...and), *bu...bu* (not...unless), *yitou...yitou/yibian... yibian* (X...while Y), *huoshi...huoshi /haishi...haishi* (either...or), *suiran...danshi* (although...yet), *yinwei...suoyi* (because...therefore), *jiran...jiu* (inasmuch as...then), *yaoshi/yao/jiaru... jiu* (if...then), *chufei/chule... bu* (unless...not), *chufei/chule...cai* (only if...then), *bushi...jiushi* (if not...then), *zhiyao...jiu* (so long as...then), *shangqie...hequang* (not even...how much more), *budan...bingqie / erqie* (not only...but also), *ninke...yebu* (would rather...than), *yuqi/youde...ningke/buru/haishi* (rather than...had better), *jinguan...haishi* (not matter if...still), *zai/duo...ye* (no matter how...still), *jiushi/jishi...ye* (even if...then), *gang(cai)...jiu* (just as...then), *yi...jiu* (as soon as...then). Many of these pairs will be discussed below.

c. **Yi* zhuxi chulai, qunzhong *jiu* gu-zhang
d. *Zhuxi *yi* chulai, *jiu* qunzhong gu-zhang

(5) a. *Suiran* An Xian nianji xiao,
although An Xian age small,
ta *que* shemme dou hui
he however anything all can

Although An Xian is young, he can do everything
b. An Xian *suiran* nianji xiao, ta *que* shenme dou hui
c. **Suiran* An Xian nianji xiao, ta *que* shenme dou hui
d. *An Xian *suiran* nianji xiao, ta *que* shenme dou hui

(6) a. *Yinwei* Da Niu sheng bingle, *suoyi* mama
because big ox grow sick, therefore mother
hen danxin
very worried
Because Da Niu is ill, therefore (his) mother is very worried
b. Da Niu *yinwei* sheng bingle, *suoyi* mama hen danxin)
c. **Yinwei* Da Niu sheng bingle, mama *suoyi* hen danxin
d. *Da Niu *yinwei* sheng bingle, mama *suoyi* hen danxin

(7) a. *Bushi* ni lai, *jiushi* wo qu
not-is you come then-is I go
Either you come, or I go
b. *Ni *bushi* lai, *jiushi* wo qu
c. Ni *bushi* lai, wo *jiushi* qu
d. *Ni *bushi* lai, wo *jiushi* qu

The four classes of correlative markers have the following properties:

A. in both halves, the subject must precede the correlative marker (4): *yi...jiu*.
B. the correlative marker can either precede (5a) or follow (5b) the subject. In the second half of the construction the correlative marker always follows the subject: *suiran...que*.
C. this pattern is like (B) in allowing both order of subject and correlative marker in the first half of the construction, but differs in

the second half where the correlative marker must *precede* its subject (6): *yinwei ...suoyi*.

D. the last class allows two possible orders in *both* halves, subject to a parallelism restriction: the order of correlative marker in the second half of the construction must be the same as that in the first half (7): *bushi ...jiushi*.

The table in (8) summarises these ordering properties.

(8)

TYPE A	SUBJ	CM	SUBJ	CM
= (4a)	Zhuxi	yi	qunzhong	jiu
TYPE B	SUBJ	CM	SUBJ	CM
i. = (5a)	An Xian	suiran	ta	que
	CM	SUBJ	SUBJ	CM
ii. = (5b)	Suiran	An Xian	ta	que
TYPE C	CM	SUBJ	CM	SUBJ
i. = (6a)	Yinwei	Da Niu	suoyi	mama
	SUBJ	CM	CM	SUBJ
ii. = (6b)	Da Niu	yinwei	suoyi	mama
TYPE D	CM	SUBJ	CM	SUBJ
i. = (7a)	Bushi	ni	jiushi	wo
	SUBJ	CM	CM	SUBJ
ii. = (7c)	Ni	bushi	wo	jiushi

Ordering of subject and correlative markers is one property of correlative constructions for which an account is required. A second property, which is the major focus of Liu's paper, is the occurrence in these constructions of phonologically empty pronouns.As is well-know, anaphoric pronouns can be either phonologically realised or phonologically empty in Chinese with a very considerable degree of freedom (cf. Chen 1984,Huang 1984, Li and Thompson 1979 and Xu 1986). The passage given as (9) below exemplifies some of the

possibilities. It is taken from Chen (1984) and zeros are used to mark positions that have been analysed as being filled by empty NPs.

(9) Lao Qian you zhemme ge piqi
Lao Qian had this-kind-of a temperament
Ø wen Ø pengyou yao shenme dongxi
(he) ask (his) friend want what thing
Ø like jiu dei gei Ø Ø
(he) immediately then must give (him) (it)
Ø bu gei Ø Ø
(he) not give (him) (it)
Ø jiu juede Ø shi qiaobuqi ta
(he) then felt (he) is despise him
Ø jitian bu gaoxing
(he) several-days not happy

Old Qian had this kind of personality: if he asked his friend for something, the friend must give him it immediately; if he didn't, then Old Qian would feel that the friend must despise him and would be displeased for several days.

Liu gives the following examples to illustrate the distribution of pronouns in correlative constructions.[3] (10) is an example of Type A, where the subjects must precede the correlative markers. Here a zero pronoun is obligatory.

(10) Xiao Ming yi jiandao wo, (*ta) jiu xiang wo
Xiao Ming as-soon-as see me, she then to me
zhao shou
wave hand
As soon as Xiao Ming saw me, she waved at me

---

3 As usual, (X) denotes that X is optional; (*X) that X is not possible and *(X) that X is obligatory. The judgements given here are Liu's. Not all Chinese speakers share them. We will not discuss alternative judgements here, but will restrict our attention in this paper to the pattern of judgements given in the text.

(11) is an example of Type B, in which alternative orders are possible in the first half of the construction, and the subject precedes the correlative marker in the second half. Here zero pronominals are optional when the subject of the first clause *precedes* its correlative marker, but obligatory otherwise.

(11) a. *Suiran* An Xian nianji xiao,
although An xian age small,
(ta) *que* shemme dou hui
he however anything all can
Although An Xian is young, he can do everything

b. An Xian *suiran* nianji xiao,
An xian although age small,
(*ta) *que* shemme dou hui
he however anything all can

(12) is an example of Type C, in which again both orders are possible in the first half, but in the second half, the subject *follows* the correlative marker. Here we find that possible zero pronominal occurrences are similar to those in (11), except that, when the first half is subject-initial, a zero pronoun is dispreferred rather than impossible.

(12) a. *Yinwei* Da Niu sheng bingle,
because big ox grow sick,
suoyi (ta) mei-lai shang ke
therefore he did-not-come attend class
Because Da Niu was ill, he didn't come to class

b. Da Niu *yinwei* sheng bingle, *suoyi* ?(ta) mei-lai
big ox because grow sick, therefore he did-not-come
shang ke
attend class

Finally, in (13) we have examples of Type D, where there must be parallel orders in each half. Here an overt pronoun is preferred when it *follows* the correlative marker, but is impossible when it *precedes*.

(13) a. *Bushi* Li Si jicuole, *jiushi* ?(ta) wangle
not-is Li Si misremember, then-is he forget
Either Li Si misremembered, or else he forgot
b. *Li Si *bushi* jicuole, (*ta) *jiushi* wangle
Li Si not-is misremember, he then-is forget

In (14) is a table which is taken from Liu (1981) which summarises this correlation between ordering properties and zero anaphora.

(14).

TYPE A	SUBJ	CM	SUBJ	CM	ZERO-ANAPHORA
= (10)	Xiao Ming	yi	(*ta)	jiu	Obligatory
TYPE B	SUBJ	CM	SUBJ	CM	
i. = (11a)	An Xian	suiran	(*ta)	que	Obligatory
	CM	SUBJ	SUBJ	CM	
ii. = (11b)	Suiran	An Xian	(ta)	que	Optional
TYPE C	CM	SUBJ	CM	SUBJ	
i.= (12a)	Yinwei	Da Niu	suoyi	(ta)	Pronoun preferred
	SUBJ	CM	CM	SUBJ	
ii. = (12b)	Da Niu	yinwei	suoyi	(ta)	Optional
TYPE D	CM	SUBJ	CM	SUBJ	
i. = (13a)	Bushi	Li Si	jiushi	(ta)	Pronoun preferred
	SUBJ	CM	SUBJ	CM	
ii. = (13b)	Li Si	bushi	(*ta)	jiushi	Obligatory

The first two columns give the relative order of the subject and the correlative marker (CM) for the first clause, and the second pair give the relative order for the second clause. The comments in the final column under the heading 'zero anaphora' give the status of phonologically empty pronouns in the subject position of the second clause.

Liu (1981:200) provides the following a descriptive generalisation about this patterning:

(15) Zero anaphora is obligatory in parallel structures if the subject precedes the [correlative] marker; otherwise it is optional. (In parallel structures with the subject following the [correlative] marker the pronoun is preferred.)

To render the data supporting this generalisation more transparent, we present in (16) a reorganisation of Liu's table (14) in which we make the primary sorting key the status of the pronoun, and the secondary key the order of correlative marker and subject. In Liu's table, the primary key is the individual correlative markers; a consequence of the reclassification in (16) is that some correlative markers appear under more than one heading. This will be significant.

(16)	a	SUBJ	CM	SUBJ	CM		PRONOUN
			yi		jiu	A	
			suiran		que	B.i	Obligatory zero
			bushi		jiushi	D.ii	
	b.i	CM	SUBJ	SUBJ	CM		
		suiran			que	B.ii	Optional
	b.ii	SUBJ	CM	CM	SUBJ		
			yinwei	suoyi		C.ii	Optional
	c	CM	SUBJ	CM	SUBJ		
		yinwei		suoyi		C.i	Overt preferred
		bushi		jiushi		D.i	

We now have a generalisation about the distribution, but we do not as yet have an explanation. It is to this that we now turn.

The essence of our proposal is the claim that correlative constructions are in fact coordinate constructions, as Chao (1968) suggested. To make this claim specific, we provide in (17) a rule schema to define for these constructions.

(17) V^2 --> H[CONJ α_0], H[CONJ α_1][4]
where $\alpha \in$ {<yinwei, suoyi>, <bushi, jiushi>,<suiran, que>, <yi, jiu>, <ye, ye>}

(17) is Gazdar et. al.'s Binary Coordination Schema (1985: 171), with a category value assigned to the mother and the lexical values of the Chinese correlative markers given as values of the CONJ feature.[5] The essence of the GPSG analysis of coordinate structures is that all conjuncts are heads. This ensures (via the Head Feature Convention) that conjuncts share relevant properties, such as categorial identity. Hence, in any instantiation of (17), the two daughters will both be V^2.[6]

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4 V^2 subsumes both S and VP.

5 The rule says nothing about the relative order of the daughters. This will be determined by a Linear Precedence (LP) statement. See Gazdar et. al. (1985: 172) for details.

6 A possible objection to our proposal that correlative constructions are in fact coordinate constructions might be that they do not possess a uniform semantics. To this we respond that the crucial property defining these constructions is multi-headedness and we use the term 'coordinate structure' to refer to this. It does not necessarily follow that such constructions share a common pattern of semantic interpretation. We would assume, although we will not attempt to justify it here, that the semantics of these constructions is compositional and that the coordinating morphemes themselves make a compositional contribution to the semantics of the construction as a whole.

A second objection, due to Dick Hudson (personal communication) is that at least some of these correlative markers are, in fact, adverbs and not conjunctions (in particular *ye* 'also'). While it is true that the label 'adverb' is applied in this way, it is also a fact that adverbs as a class are notoriously difficult to define and the these items do not share the distribution of Chinese manner adverbials, nor the distribution of, say, temporal adverbs. Lest translation equivalents muddy the decision on this point, note that whereas English *also* does have a characteristics adverb distribution ('Also,

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Thus far, modulo the different lexical items involved, we are claiming that coordination in Chinese and English is essentially the same. We propose, however, that Chinese differs from English in two crucial respects. The first is that in Chinese the feature CONJ is a member of the set of head features, as specified in (18).

(18) CONJ ∈ HEAD

This means that it will be subject to the Head Feature Convention with the result that we will get the effect of percolation of that feature and its value down through heads from the position at which it is introduced by the rules of the grammar.

Secondly, the Chinese rules which spell out the conjunction itself, (19) and (20), making it a sister of a category identical to the mother, are, in contrast to their English counterpart, category specific.[7]

(19) S[CONJ α] --> {[SUBCAT α]}, H[CONJ NIL]
where α ∈ {yinwei, suoyi, bushi, jiushi, suiran}

(20) VP[CONJ α] --> {[SUBCAT α]}, H[CONJ NIL]
where α ∈ {yinwei, bushi, jiushi, ye, suiran, que, yi, jiu}

Crucially there are different rules in (19) and (20) for sentences and for VPs. They differ specifically in respect of the particular coordinating conjunction that can be instantiated as a sister of the head. So, these rules specify that *suoyi* can only appear as a sister of S, and that *ye*, *que*, *yi* and *jiu* can only appear as sisters of VP. The remainder (*yinwei*, *bushi*, *jiushi*, *suiran*) can occur as sister of either VP or S. These rules, therefore, will licence the following trees: sentential coordination in (21), and VP coordination in (22)

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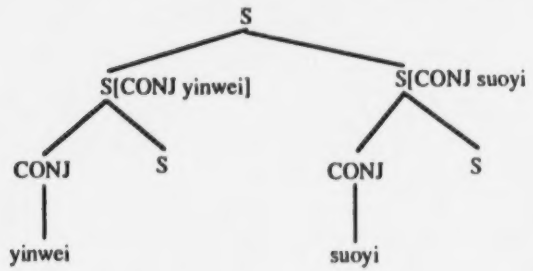
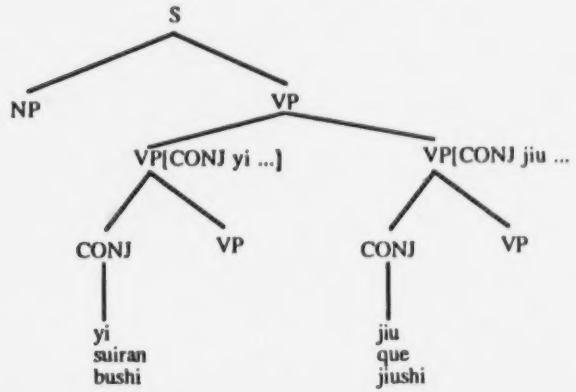
he speaks French'; 'He also speaks French'; 'He speaks French also'), this is not true of *ye* which can only appear in the pre-VP position specified by (20).

7 In fact, these restrictions would be enforced on instantiated features by Feature Coocurrence Restrictions. For simplicity of presentation we have chosen fto by-pass these details here.

(21)

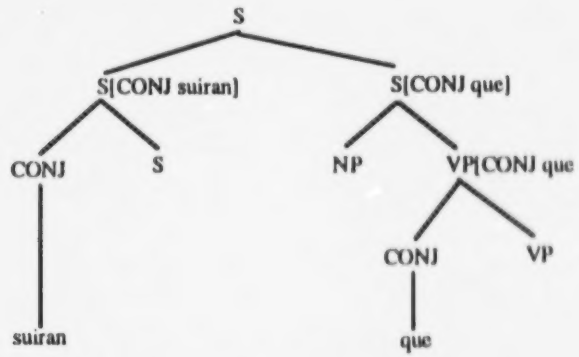


(22)



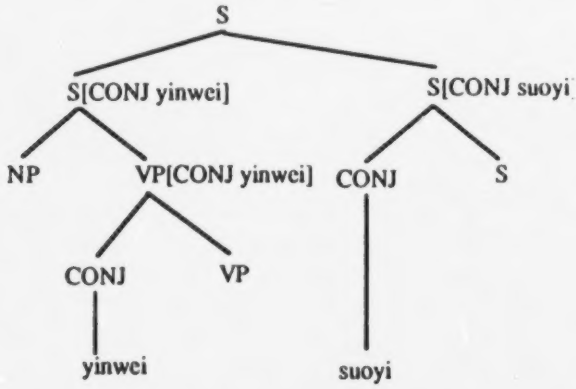
Note, however, that although these rules preclude the appearance of certain conjunctions as sisters to S or VP, they do not restrict the instantiation of the CONJ feature on an S or VP node. Indeed, the Head Feature Convention will ensure that mother and head daughters must share permitted feature instantiations. Therefore, in addition to (21) and (22), the rules admit the following trees, in which the coordinated category is S, but one or more of the coordinating conjunctions appears as a sister of VP.

(23)



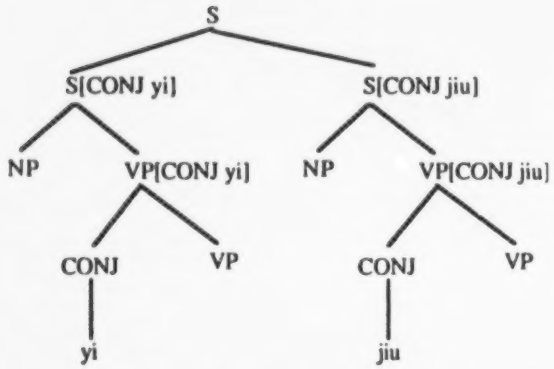
Here the CONJ feature in both conjuncts is introduced at the S level by rule (17). They differ, however, in the level at which the conjunct themselves can be realised *Suiran* (although) is realised at the S level, but *que* (yet) is only realised at the VP level. The CONJ feature 'percolates' down the tree as a consequence of the Head Feature Convention.

(24)



Yinwei (because), but not *suoyi*(therefore), can also be realised at the VP level. Here too, the CONJ feature percolates down the tree as a consequence of the Head Feature Convention.

(25)



Yi (as soon as) and *jiu*(then) are both realised at the VP level, although they express a sentence-level coordination. Again, the CONJ feature percolates down the tree as a consequence of the Head Feature Convention.

Note also that the requirement that conjuncts in Chinese precede their heads and that subjects preceded their VP sisters accounts straightforwardly for the ordering facts discussed above.

Now, it might be objected that having two separate rules like (19) and (20) which are category-specific spellings out of coordinating conjunctions, is unmotivated and *ad hoc*. Our response to this objection is to point out that this kind of thing is in any case necessary for Chinese, because coordinating conjunctions are indeed category specific, as (26) illustrates.

(26) a. Wo gen/he ni dou qu
I and you all go
I and you are both going

b. Wo ye qu, ni ye qu
I also go you also go
I and you are both going

c. *Ye wo ye ni qu
also I also you go
(I and you are both going)

In Chinese we have a situation in which NPs, for instance, take a different set of coordinating conjunctions to the verbal projections which we have been discussing above.

The coordination rule for NPs will look like (27),

(27) NP --> H[CONJ α_0] H[CONJ α^1]
where $\alpha \in$ {<NIL gen> <NIL he>}

which defines NP coordinating conjunctions to be the morphemes *gen* and *he*. We therefore need category-specific conjunctions for Chinese anyway. Our proposed analysis of correlative constructions merely extends this to S and VP, with some degree of overlap between the two.[8]

The analysis thus far has only been concerned with the distribution of correlative markers. We have not yet touched on the issue of zero anaphora. Recall that, according to Liu's generalisation, we get several instances of obligatory zero anaphora when in *both* conjuncts the coordinating conjunctions occur after the subject. According to our analysis, the correlative markers occur in this position because they have been realised at the VP level. They are therefore by the rules that we have given for VP coordination. So the simple answer the reason why there are no *overt* pronouns in the second conjunct in these cases is because there is no noun phrase in the second conjunct at all. These constructions are simply instances of the structure in (22) – coordinated VPs. So the reason also why we *do* get overt pronouns in the other

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8 Note also that English coordinating conjunctions exhibit some degree of category-specificity. *Both...and* is decidedly awkward with bare S's

i. ?Both John is rich and Mary is rich.

while being fine with S':

ii. Max stated both that John is rich and that Mary is rich

Either...or on the other hand is good with both

iii. Either John is rich or Mary is rich

iv. Max stated either that John is rich or that Mary is rich

kinds of structures is because they all involve cases of *sentential* coordination.[9]

There is some interesting support for this position from a rather different kind of evidence. Chen (1984), a study of the distribution of Chinese zero anaphors in discourse, provides the following statistics for the occurrence of zero anaphora in the corpus:

(28) Relative occurrence of zero anaphora (Chen 1984:15)

Syntactic position	Number	Percentage
topic/subject	43	75.4
direct object	11	19.3
indirect object	3	5.3

A glance at these results reveals a striking asymmetry between the number of occurrences of topic/subject zero anaphors and the number of occurrences of their direct object and indirect object counterparts, with the former being by far and away the most frequently occurring kinds of empty categories. Why should there be this asymmetry? Our analysis

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9 It is valid to ask how one can be sure that one is dealing with VP coordination, rather than sentential coordination, where the subject of the second conjunct is a zero-pronoun. This is a difficult question to answer conclusively. What can be demonstrated is that there is indeed evidence that Chinese actually allows VP coordination. On the assumption that zero-pronouns in Chinese are simply the covert versions of their overt counterparts and, in particular, that they serve the same anaphoric functions, the fact that there are coordinate structures such as (i) below which do not permit an overt pronoun in the second conjunct, should serve to argue that we have here a situation in which a pronouns are not permitted. The only remaining option is VP coordination.

i. Meige ren ye dou hui shuo Hanyu,
every man both all can speak Chinese
(*ta) ye dou hui shuo Yingyu
(*he) and all can speak English
Everyone can speak both Chinese and English

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provides the basis for an explanation. Since Chen does not consider the possibility of VP coordination, all such potential instances VP coordination are treated as examples of zero subject anaphora. A plausible account of the much greater frequency of occurrence of zero subject anaphors is that more than one construction is involved. A combination of VP coordination with genuine zero discourse anaphora provides a double source for the number of apparent empty topic/subject positions. For object positions, by contrast, there is no coordination possibility which has the appearance of a zero pronoun; in these cases we are only going to get missing objects where there are, indeed, missing objects. So we suggest that the statistics which Chen has produced are the result of a kind of conspiracy between real empty NPs and the facts of VP coordination.

What we have tried to do in this paper is to outline an analysis of Chinese correlative constructions which not only gives a principled account of the distribution of correlative markers, but which also offers the prospect of an explanation for some puzzling facts about the the distribution of anaphoric pronouns. Our suggestion is that Liu and Chen have misidentified instances of VP coordination as zero-anaphora in such constructions. This leads us to raise a more general question about zero-anaphora. It seem clear to us that better criteria are required for the identification of zero-anaphors in languages like Chinese, which lack corroborative evidence (such as agreement morphology). There is a danger that the implicit criteria are simply that if what could be an NP position is empty, it must in fact be occupied by a zero-anaphor. Sometimes (but not with respect to the data we have discussed in this paper), it even seems that the occurrence of an overt pronoun in an English translation is sufficient evidence to warrant the postulation of a zero-anaphor in Chinese. We have shown in this paper that, for at least a subset of Chinese, a better account is available without zero-anaphors.[10]

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10 We should point out that our analysis is certainly not the last word on the subject. While it is correct to say that when VP coordination is the only possibility overt subject pronouns are excluded and where sentential coordination is possible then overt subject pronouns are possible, there is a third situation for which our analysis does not provide a complete account. For correlative markers of the *yi...jiu* (as soon as...then) type, we propose

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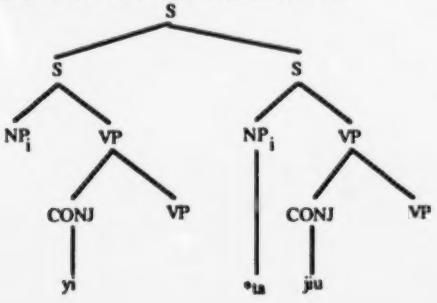
that there is sentential coordination, but that the correlative markers are spelled out at the VP level. This is because they occur in post-subject position. The other aspects of our analysis would lead us to expect that, because the second conjunct contains a subject position, an overt pronoun should be possible there. This is not in fact the case:



Clearly, additional factors are at work here which serve to limit the permissible structure to VP coordination.

19 BEST COPY AVAILABLE